

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-6 are presently active in this case; Claims 7-21 having been withdrawn from consideration, and Claim 1 having been amended by way of the present amendment.

In the outstanding Official Action, Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ogura et al (U.S. Pat. No. 6,255, 166) and Pradeep et al (U.S. Pat. No. 6,228,713). Claims 2, 3, and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ogura et al and Pradeep et al, and further in view of Reisinger (U.S. Pat. No. 6,137,718). Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al, Pradeep et al, and Reisinger, and further in view of Agarwal et al (U.S. Pat. No. 6,201,276). Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al and Pradeep et al, and further in view of Fang (U.S. Pat. No. 6,023,085).

The Office Action acknowledges that Ogura et al do not show a first and second transistor isolated by a trench, and then indicates that Pradeep et al teach to isolate memory cells with trench isolations 24 in element isolation regions with the charge storage layer 14.¹

More specifically, Applicant submits that Pradeep et al disclose in Figure 7A an isolation layer 24 filling a trench 20 and a floating gate 14 formed on a gate oxide layer 12 on the element region. Applicant submits, however, that Pradeep et al do not show the features defined in presently amended Claim 1. Specifically, Applicant submits that a bottom insulating film formed on an inner surface of a trench and correspondingly a charge storage layer whose width corresponds to a width of an element region of the semiconductor substrate and a thickness of the bottom insulating film are features defined in Claim 1 that are not disclosed or suggested in Pradeep et al. For example, Figure 7A of Pradeep et al shows only

a side of the isolation layer 24 in contact with the elemental region 10 of the trench. There is no bottom insulating layer formed on an inner surface of the trench with an insulating film (i.e. a trench filling film) on the bottom insulating layer. Indeed, the formation of the trench in Pradeep et al, as illustrated in Figure 3B, 3C, and 4A, results by the direct chemical vapor deposition of the trench filling isolation layer 24 in the etched trench.² Accordingly, Pradeep et al do not disclose or suggest the bottom insulation film defined in presently amended Claim 1, and thus do not disclose or suggest a charge storage layer whose width corresponds to a width of an element region of the semiconductor substrate and a thickness of the bottom insulating film, as defined in Claim 1. In general, an insulating film formed by deposition has insulating properties lower than that of an insulating film formed on a surface (e.g. by direct oxidation). Thus, when a bottom insulating film is formed on an inner surface of the trench, as defined in the presently amended Claim 1, the resulting insulation exceeds that of only a deposited layer such as for example the trench filling layer in Pradeep et al. As a result, Applicant submits that the charge retention characteristics of the semiconductor memory defined in Claim 1 are better than the charge retention characteristics of the semiconductor memory of Pradeep et al.

Hence, for the above-noted reasons, the features set forth in presently amended independent Claim 1 are advantageous and not disclosed or suggested in the applied prior art. Thus, Claim 1 and the claims dependent therefrom are believed to patentably define over the applied prior art.

¹ Office Action, page 3, lines 12-19.

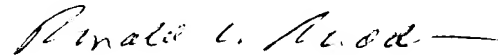
² Pradeep et al, col. 5, lines 42-46.

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Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application, as amended herewith, is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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